ALASKA

- MAPPING
- AUTOMATED CARTOGRAPHY
- REMOTE SENSING

BLM-ALASKA STATE OFFICE
DIVISION OF OPERATIONS
BRANCH OF PHOTOGRAMMETRY

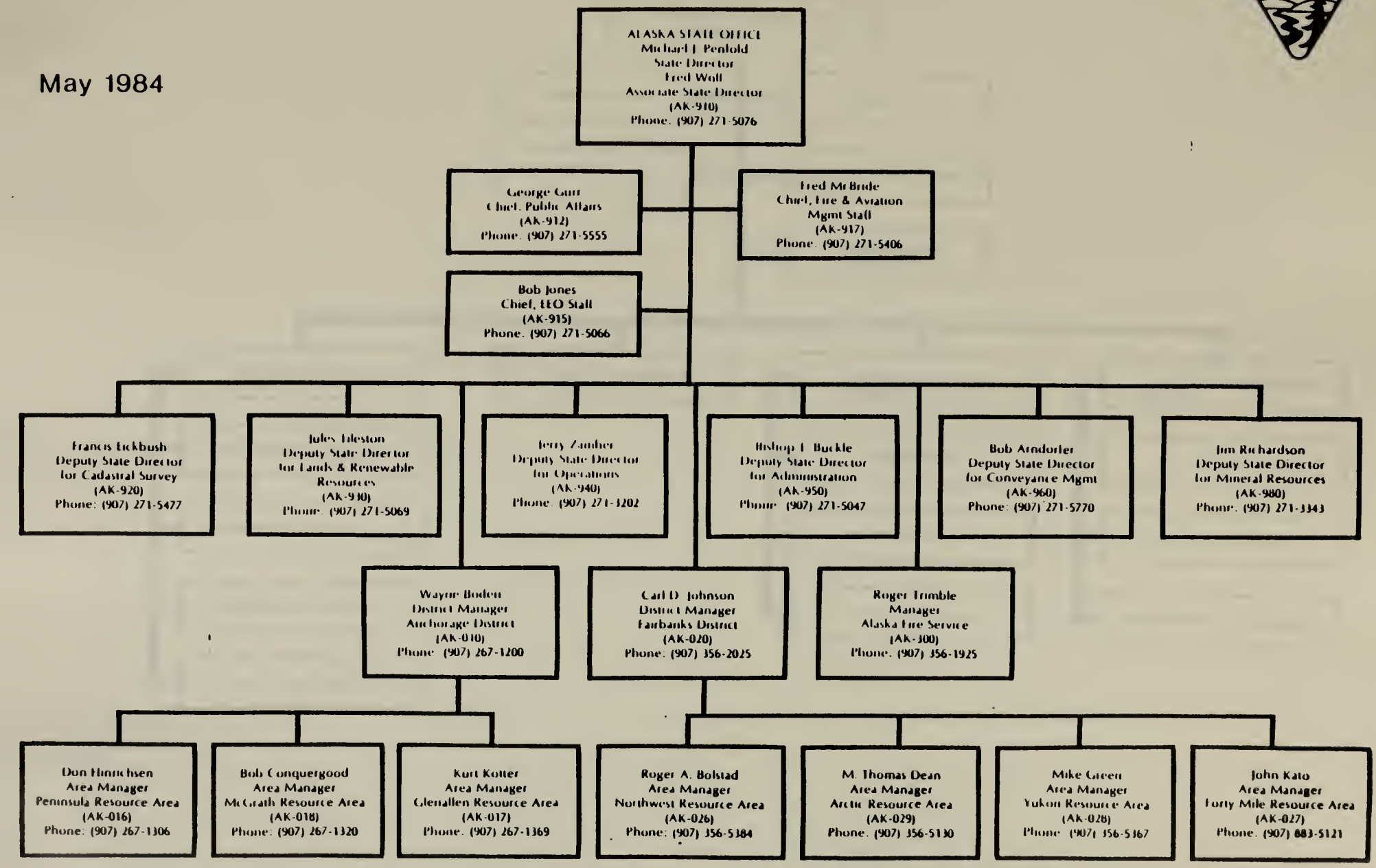
DIVISION OF OPERATIONS

BRANCH OF PHOTOGRAMMETRY

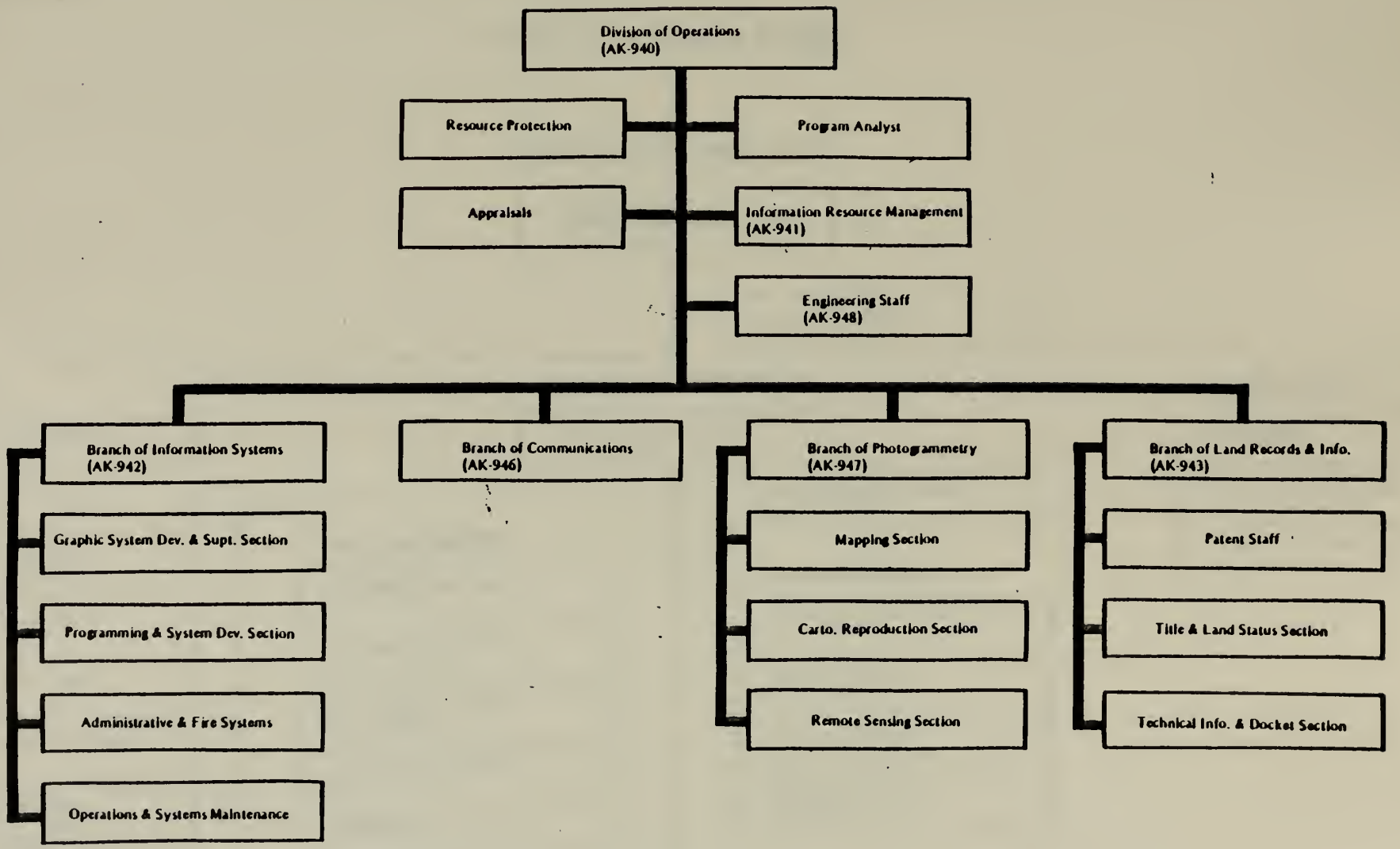
ORGANIZATION

BLM ALASKA STATE ORGANIZATION

May 1984



ALASKA STATE OFFICE



May 1984

DIV OF OPERATIONS

PHOTOGRAMMETRY

Branch Chief
Supervisory Cartographer
Ray Thomas

Secretary
Dianne Harrison

MAPPING

Supvy Cartographer
Paula Krebs

Cartographic Tech
Gust Panos

Cartographic Tech
Charles Haddox

Cartographic Tech
Bruce Ockrassa

Cartographic Tech
Mike Clark

Photo Interpreter-Lead
Vacant

Photo Interpreter
Lynette Nakazawa

Photo Interpreter
Cheryl McCaffrey

Photo Interpreter
Mike Motschenbacher

Photo Interpreter
Leo Chaput

File Clerk
Kathleen Jackson

CARTOGRAPHIC REPRODUCTION

Supvy Cartographic Tech
Pat Lillian

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Cathy Bolds

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Norman Ames

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Dwayne Richardson

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Cliff Ligons

Bindery Worker
Debbie Peay

Bindery Worker
Charles Luddington

Bindery Worker
Pat Smith

DRAFTING

Cartographic Tech
Bill Waldron

GEOPROCESSING

Ecologist
Page Spencer

Physical Scientist
Dianne Osborne

Natural Resource Specialist
Steve Hartman

PRIMARY FUNCTIONS

MAPPING PROGRAM

Branch of Photogrammetry
Division of Operations
BLM - Alaska State Office

The Branch of Photogrammetry has the lead in the mapping sciences for BLM-Alaska with responsibility for applications in support of Conveyances, Cadastral Survey, Energy, Fire, and Resources. The requesting office outlines project requirements which are then used to develop design criteria, product specifications, and procedures to meet mapping needs. The types of map products include: 1) rectified and orthophotos which are distortion free and which may be composited with the rectangular land net, 2) meander line maps in the format of the rectangular survey plat and associated tabular data of upland acreage, 3) administrative/management units such as fire management plans, engineering site maps, and 4) easement identification maps.

Many mapping processes in BLM-Alaska use computer assisted techniques to meet project requirements. Photogrammetric mapping produces rectified/orthophoto products which are used by realty specialists for Native Allotment field exams, by the field surveyor when doing the rectangular survey, and in the production of meander line data for the rectangular survey plat. Photointerpretation criteria are established to provide documentation for meander line determination from aerial photos. The photointerpreted data are merged with existing field survey information and are then digitized for computer entry. These data are processed for output in the format of the rectangular plat with an upland acreage listing. The goal is to automate the production of rectangular survey plats by merging photointerpreted meander line data with rectangular or survey data using computer assisted cartography.

Other mapping support is provided by special project digitizing for Fire, District Offices and Resource Areas, resource programs, and Information Services to produce graphic and tabular data. Aerial photographic based map products are provided by the photo lab in support of map projects. Maps in support of ANCSA are of selections, easements, and navigability to be used as official documents in the conveyance process.

The Branch of Photogrammetry provides technical support through public contact service, the photo lab, and printing and reproduction services. BLM-Alaska State Office is the repository for the federal copy of the Alaska High Altitude Photography Program. This data source has been acquired through funding of a cooperative agreement among ten federal agencies and one state agency. Through this program ninety (90) percent of Alaska to date is covered with recent aerial photos.

The Mapping and Cartographic sections have expertise in manual and digital cartography. The section chiefs are responsible for project planning, workload assignments, project coordination with requesting offices and development phases. Personnel in support of the mapping program are as follows: three analytical plotter operators, four photointerpreters, four digitizers, one cartographic technician for manual mapping, four photo lab personnel, and three program support personnel.

Current Projects

1. Conveyances - Native Allotment Field Exams

The Resource Areas identify 200-300 townships per year for which rectified/-orthophoto products are needed. Aerotriangulation and digital terrain data are produced on a model by model basis for the target areas. Rectified or orthophotos are produced from these data and then composited with the land net grid based on control point registration. These 1:31,680 scale products are used by the realty specialist when visiting the parcel with the applicant. The annotated photo becomes part of the case file for future use by Cadastral Survey.

2. Conveyances - Field Survey

Cadastral Survey requests rectified/orthophoto landnet composites at 1:31,680 scale for use by the field crews when doing rectangular survey. The average annual request is for coverage of 200-300 townships. The increased emphasis on the use of these products is maintaining an identified two to three year workload for the mapping program.

3. Conveyances - Meander Line Data for Cadastral Survey

Cadastral Survey initially has requested meanderline data for 2,200 townships for rectangular survey plats using aerial photointerpretation. This meander line data project has completed 393 townships to date (May, 1984), 161 so far in FY 84. The annual production rate is 350 townships. Documentation of photointerpretation standards is based on field reconnaissance by a surveyor and photointerpreter in conjunction with guidelines from the Manual of Survey Instructions (1973) and procedural memoranda from Cadastral Survey. Photointerpreted meander line data which are registered to rectified or orthophotos are merged with the field calls from field survey. The overlays of meander lines are quality checked for completeness and consistency of photointerpretation, agreement with field survey data and platting conventions, and edge match between adjacent townships. These photointerpreted overlays are then digitized using AHDS (Alaska Hydrography Digitizing System) and processed thru MOSS (Map Overlay Statistical System) to provide map products in the format of the rectangular survey plat and tabular acreage listing by lot. (Examples of the steps and products follow.) The success of this project is attributed to strong coordination and commitment between the Division of Operations and the Division of Cadastral Survey.

4. Special Projects

Often a request is received to provide products over a small area for a special application. For example, Division of Mineral Resources requested orthophoto coverage over nine townships to use in an assessment for the location of exploratory drilling for oil reserves in the Arctic National Wildlife Reserve. Four to five requests of this type are received each year.

5. Conveyances - Digitizing Contract for Hydrography, Protraction Diagrams

A contract package has been prepared for digitizing hydrography from 1:63,360 scale USGS quadrangles to update protraction diagrams. Many of the protraction diagrams were derived from 1:250,000 scale quadrangles which were the only data source at the time. The project covers unsurveyed lands in areas of concern which have been targeted for conveyance actions in order to verify upland acreages. The product is digital hydrography for 1,000 - 2,000 township windows. The contract specifications were designed to permit the production of master title plats from the protraction data. An assessment of the results will be made for continuation of the project in the future providing funding is available.

GEOPROCESSING SECTION

Branch of Photogrammetry
Division of Operations
BLM - Alaska State Office

As BLM Alaska moves from a land transferring agency to a land management agency, the need increases for accurate resource data to implement plans and manage resources. Remote sensing and geoprocessing (RS/GIS) technologies are particularly effective in Alaska due to the large inaccessible areas and lack of background data. RS/GIS technology allows resource specialists and managers to rapidly overview an area and to concentrate on assessing and managing resources on a large scale. Resource data analysis is used to various extents in support of environmental assessments and impact statements, resource management plans, inventories of natural resources, fire fuels mapping, road suitability, corridor analysis and minerals trespass. This is an operational program which contributes significantly to BLM activities in Alaska.

BLM-Alaska has been a pioneer in the development of remote sensing and geoprocessing technology for the past ten years. An initial project with NASA on the Denali Hiway firmly established the utility of RS/GIS for Alaska. Currently, digital data bases are available for 28 million acres in the NPRA, Nulato Hills, and the Kvichak areas. An additional 8 million acres are in progress. A large project to map fire fuels for 250 million acres for the Alaska Initial Attack Management System project has recently begun. Formal and informal training, and coordination with District and Area Offices is a continuing activity.

The Geoprocessing section has expertise in manual and digital analysis, and applications of data bases. The Coordinator is responsible for program work. The Analyst works on digital projects, performing operational analysis and technical development. The Mapper is responsible for manual interpretation of remote sensing data. District and Area Office personnel integrate expertise of the area and work with the analysts during all phases of a project.

Resource geoprocessing in Alaska is primarily done on the IDIMS system at the USGS EROS Field Office. BLM provides analyst expertise and buys computer time to create and manipulate data bases. Technical developments are moving toward an integrated GIS system which incorporates the best from several software packages, including MOSS and IDIMS. Work with current projects has integrated data from several sources or systems into one data base. The GIS will use either raster or vector data sets for input and analysis, manipulate raster and vector data sets together, integrate tabular or textual data, and perform statistical analysis for a variety of output products. The next major move is to put geoprocessing capabilities in the District and Area Offices. Data bases will be developed by the State Office and then transferred to field offices for manipulation and product generation. The new MV 10000 computer will be a big asset to this distributed processing. We need to plan for terminals and plotters in field offices, and train personnel in their use. This move will greatly increase the utilization and applications of the data bases.

Current Projects

1. Kvichak digital data base - Peninsula Resource Area. This data base is being used to select lands and define stipulations for oil and gas leasing under ANILCA 1008. The main elements in the data base are landcover elevation, slope aspect, hydrography, villages and BLM lands. The landcover was borrowed from a large project by the State of Alaska, and the topo data base layers were created by DSC.

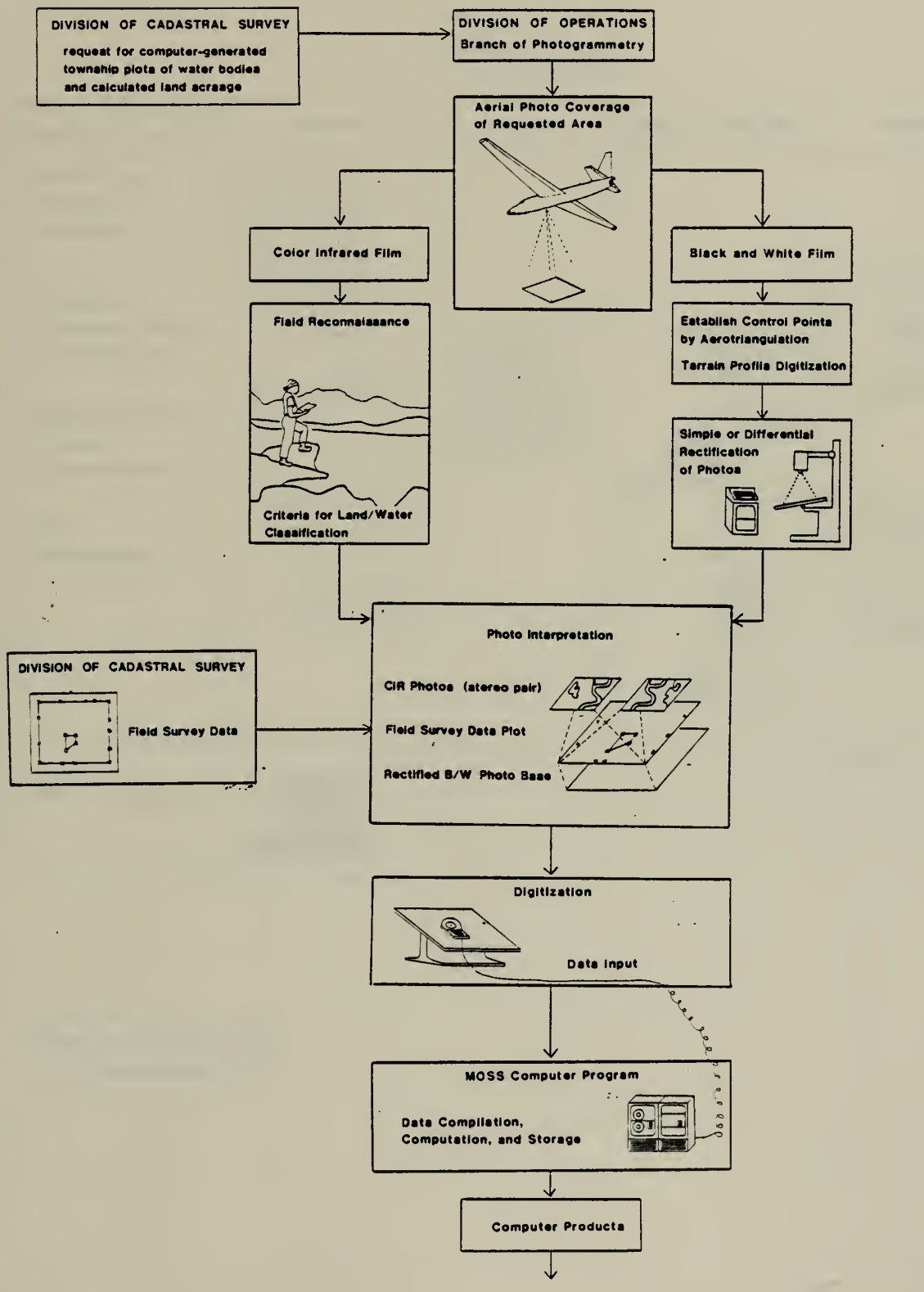
There have been several exciting developments and new applications with this data base. The topographic data were used to calculate terrain diversity, relief, and shaded relief. Combined with landcover, these images were used to interpret management units, geomorphology, and engineering restraints. Salmon streams were digitized using AHDS and processed in MOSS for transfer and incorporation in the data base. The hydrography will be used with other layers to evaluate moose, bear, and salmon habitats. Village locations and travel ranges will be merged with habitat to evaluate areas of heavy subsistence use. The next step is to incorporate ownership data from AALRS in the data base.

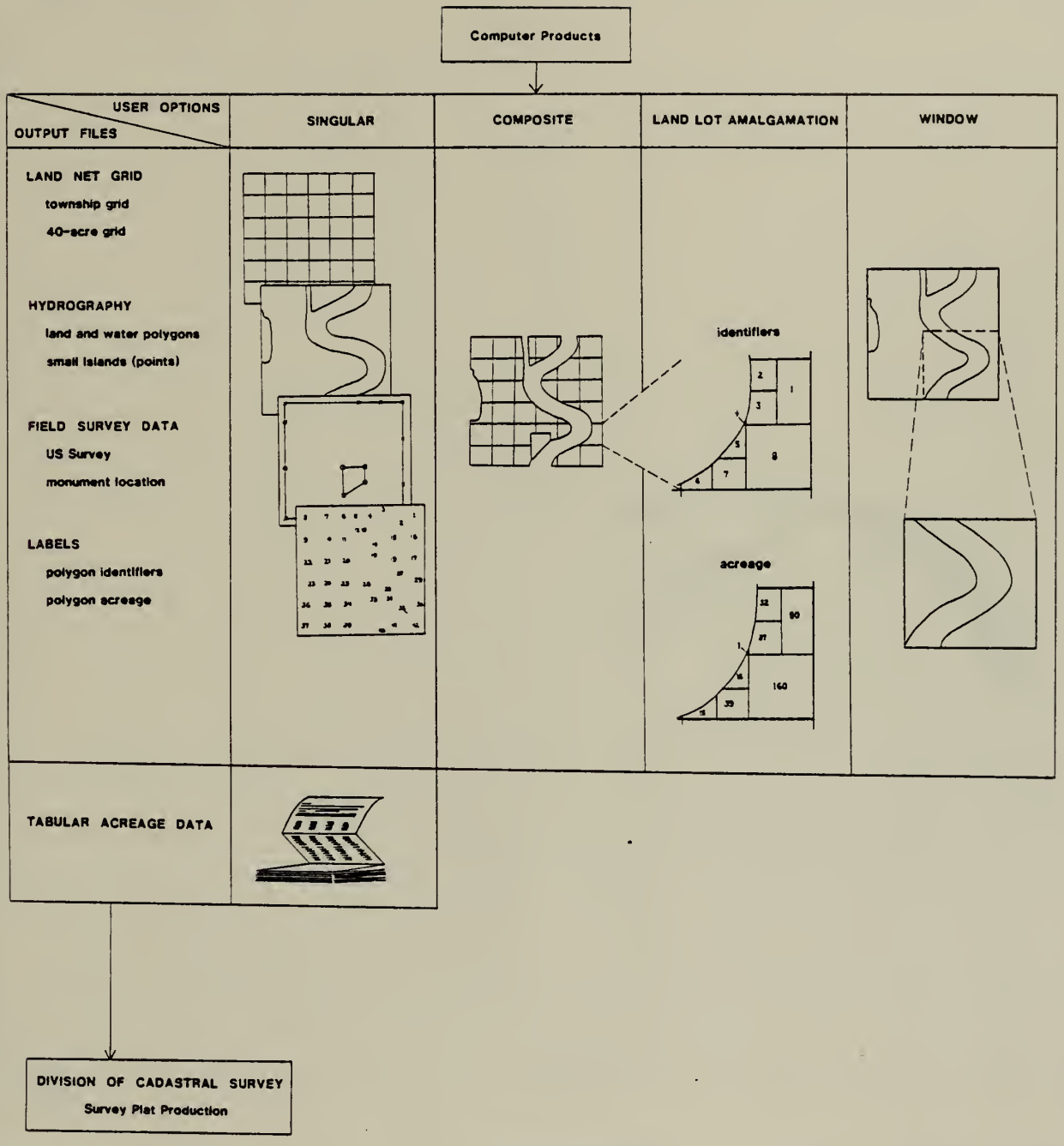
2. Anvik/Bonasilla digital data base - McGrath Resource Area. A data base is being prepared for use in preparation of an EA to support 1008 oil and gas leasing, and for resource management in the area.

3. Fire Fuels Mapping - Alaska Fire Service
Fire fuels are being mapped for 250 million acres of Alaska. These data are being manually interpreted from Landsat images. They will be digitized and incorporated into the Alaska Initial Attack Management System (AIAMS). The AIAMS data base will be used to make decisions on initial attack of wildfires.

CADASTRAL SURVEY PRODUCTS

PHOTOGRAMMETRIC SUPPORT OF SURVEY PLAT PRODUCTION

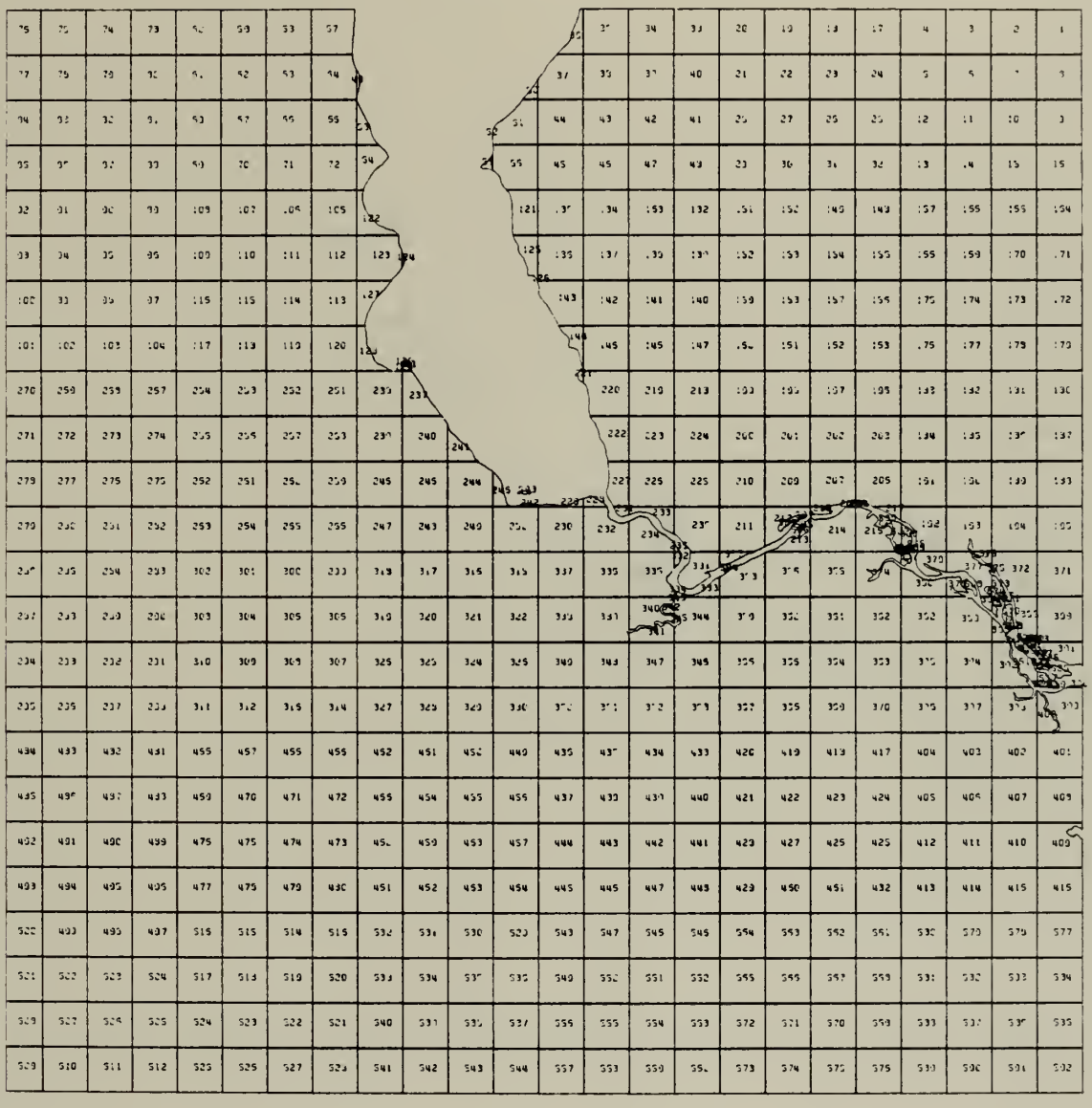



Computer Products
USER OPTIONS
OUTPUT FILES
SINGULAR
COMPOSITE
LAND LOT AMALGAMATION
WINDOW
LAND NET GRID
township grid
40-acre grid
HYDROGRAPHY
land and water polygons
small islands (points)
FIELD SURVEY DATA
US Survey
monument location
LABELS
polygon identifiers
polygon acreage
identifiers
acreage
TABULAR ACREAGE DATA
DIVISION OF CADASTRAL SURVEY
Survey Plat Production

HYDROGRAPHY FOR T13S R60W SM

BUREAU OF LAND MANAGEMENT
ALASKA STATE OFFICE
ANCHORAGE, ALASKA

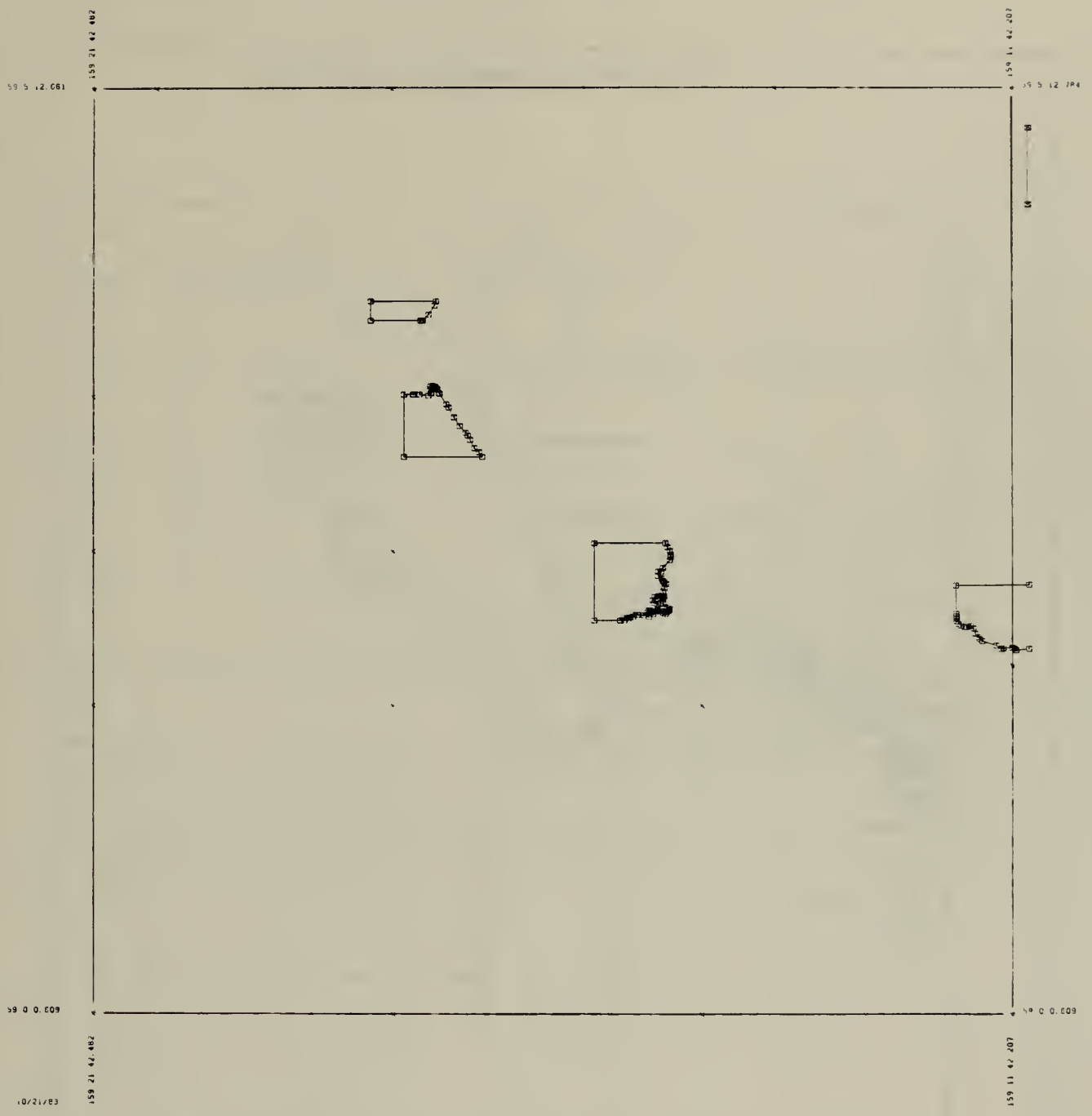
IDENTIFYING ITEM NUMBERS FOR 40 ACRE OVERLAY



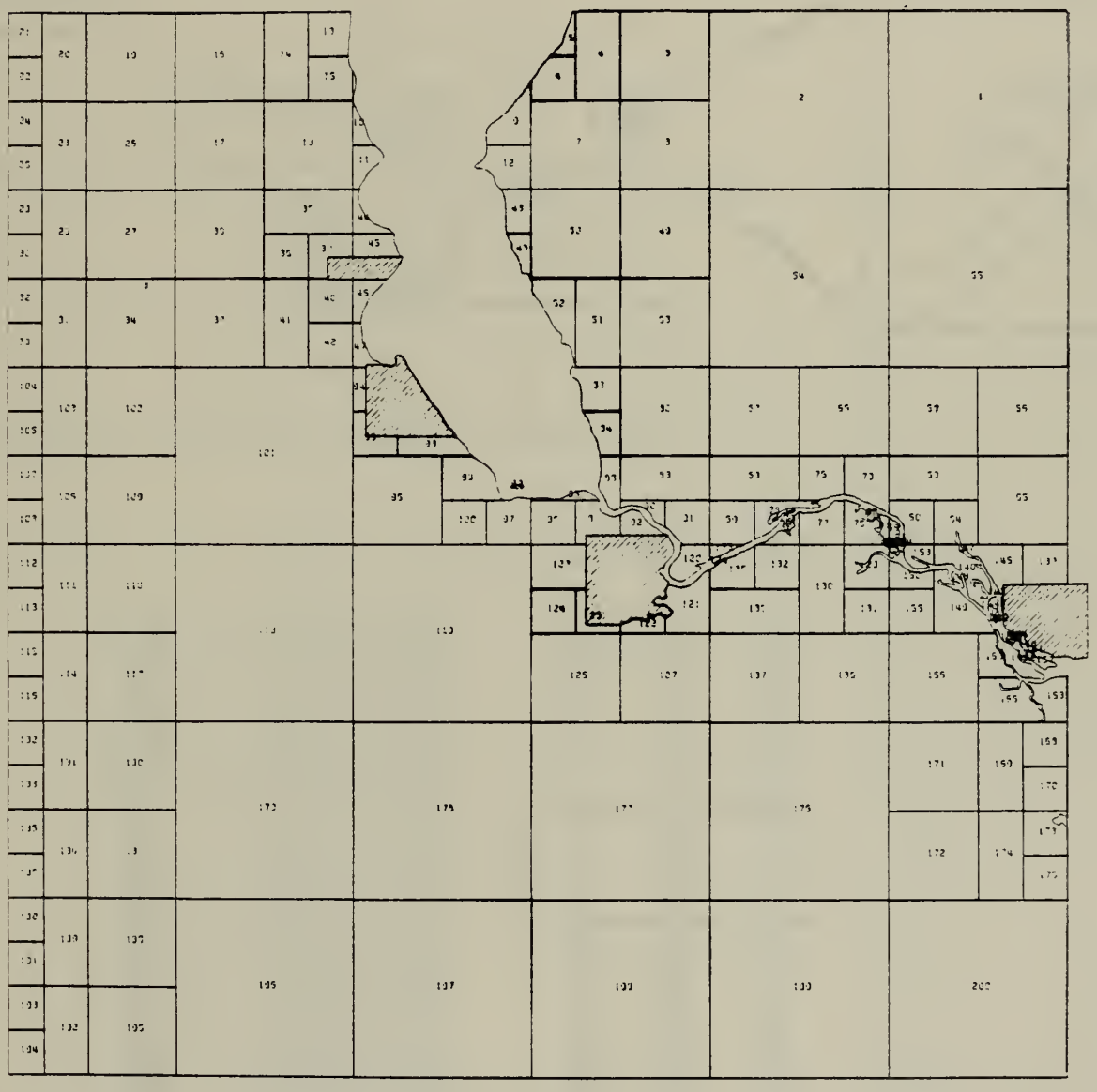
9670015
10/21/93
SAMPLE PLOT

BUREAU OF LAND MANAGEMENT
ALASKA STATE OFFICE
ANCHORAGE, ALASKA

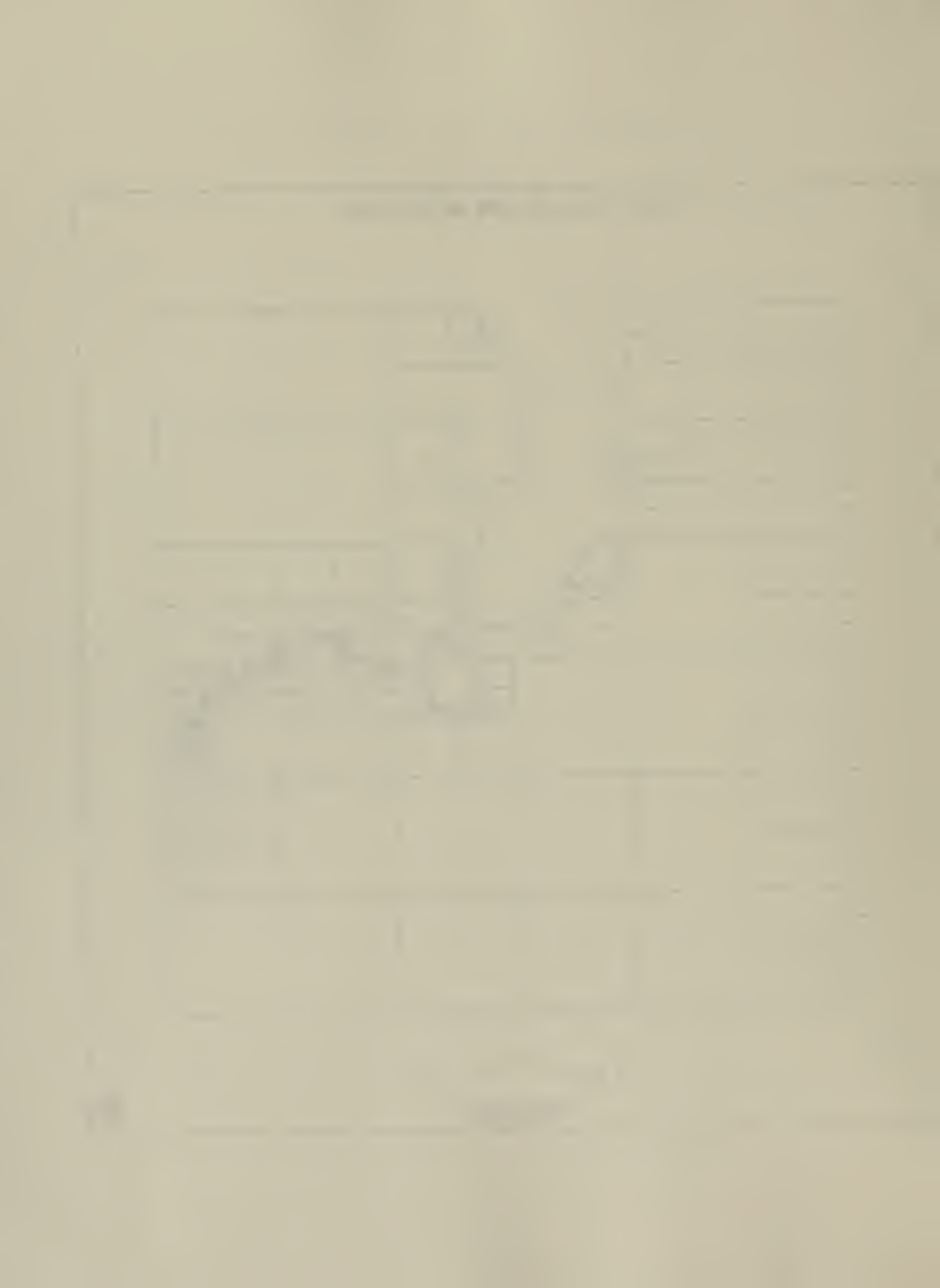
CADASTRAL DATA T13S R60W SM TWP 15971



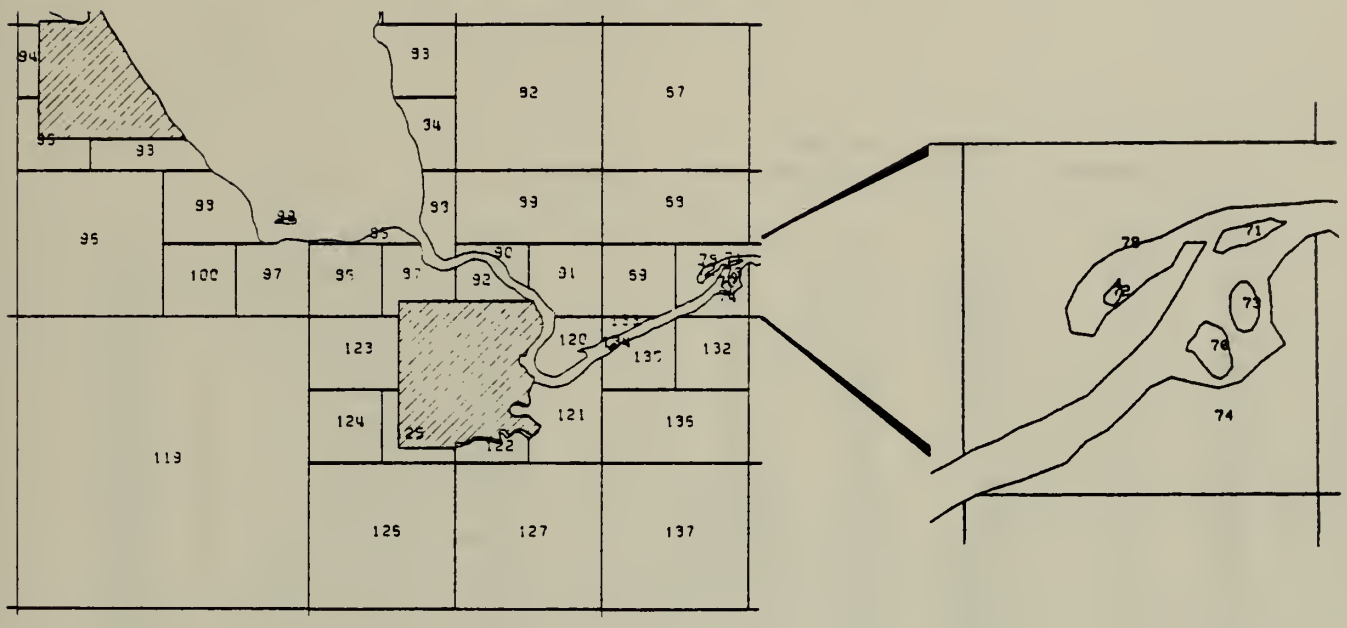
GROUP 354 T13S R60W SM TWP 15971



BUREAU OF LAND MANAGEMENT
ALASKA STATE OFFICE
ANCHORAGE, ALASKA



ITEMIZED PLOT, ENLARGEMENT AND TABULAR LISTING



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1940A	0	160.0004A0342	543140	109	2.00	160.00	0	5
1910A	0	160.0304A0360	544336	110	2.00	160.00	0	5
1925A	0	80.0004A9756	544338	111	1.50	80.00	0	5
1922W	0	31.6004A3397	544542	112	.89	31.59	0	5
1923W	0	31.5A0479395	544140	113	.90	31.65	0	5
1935A	0	80.0004A9754	543535	114	1.50	80.00	0	5
1932W	0	31.7A0479393	543738	115	.90	31.75	0	5
1933W	0	31.8A0479392	543336	116	.90	31.85	0	5
1940A	0	160.0004A0357	543531	117	2.00	160.00	0	5
2000A	0	639.0004A1565	543928	118	4.00	640.00	0	5
2100A	0	640.0004A3174	543921	119	4.00	640.00	0	5
2211L	1	20.1A44A5403	544564	120	.79	20.18	0	35
2213L	3	46.532AA5395	544150	121	1.34	46.53	0	54
2213L	5	12.99A4A5002	543981	122	.73	13.00	0	30
2221L	2	49.0464A4226	544519	123	1.11	49.04	0	5
2223A	0	40.0004A4180	544117	124	1.00	40.00	0	5
2224L	4	14.9804A4507	544050	125	1.02	14.98	0	13
2230A	0	160.0004A4379	543513	126	2.00	160.00	0	5
2240A	0	160.0004A5184	543510	127	2.00	160.00	0	5
2311L	1	.1264A7185	544699	128	.06	.13	0	7
2311L	2	37.1754A6993	544505	129	1.59	37.17	0	44
2316A	0	80.0004A6594	544309	130	1.50	80.00	0	5
2314A	0	40.0004A6995	544107	131	1.00	40.00	0	5
2321L	3	39.9244A6192	544511	132	1.00	39.92	0	6
2322L	5	5.2984A5649	544667	133	.48	5.30	0	15
2322L	6	.1514A5643	544549	134	.07	.15	0	11
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2328A	0	80.0004A5990	544110	136	1.50	80.00	0	5
2330A	0	160.0004A59AA	543507	137	2.00	160.00	0	5

TABULAR ACREAGE LISTING

GP. 354 T 13S R 60W

		SUBJECT	CATEGORY	ITEM	PERIM (MILES)	AREA (ACRES)	ISLANDS	POINTS
1033L	1	41.701484241	546879	52	1.37	41.70	0	38
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1100A	0	640.000486401	547125	54	4.00	640.00	0	5
1200A	0	640.000489009	547119	55	4.00	640.00	0	5
1310A	0	160.000488408	545912	56	2.00	160.00	0	5
1320A	0	160.000487604	545914	57	2.00	160.00	0	5
1337A	0	80.000487602	545311	58	1.50	80.00	0	5
1333L	1	4.067487242	544836	59	.38	4.07	0	42
1333L	2	31.747467435	544930	60	.95	31.75	0	18
1333L	4	.066487303	544751	61	.04	.07	0	8
1333L	5	.034487303	544713	62	.03	.03	0	6
1333L	3	.025487202	544716	63	.03	.02	0	6
1334L	6	39.089487802	544911	64	1.16	39.09	0	18
1340A	0	160.000488406	545108	65	2.00	160.00	0	5
1410A	0	160.000486800	545917	66	2.00	160.00	0	5
1420A	0	160.000485995	545920	67	2.00	160.00	0	5
1437A	0	80.000485993	545317	68	1.50	80.00	0	5
1433L	3	39.426485789	544917	69	.98	39.43	0	10
1434L	7	.523486275	544878	70	.11	.52	0	19
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1434L	6	.088486163	544942	72	.05	.09	0	9
1434L	9	.362486312	544927	73	.09	.36	0	16
1434L	5	10.251486279	544797	74	.78	10.25	0	23
1441L	1	23.909486934	544871	75	1.05	23.91	0	37
1442L	2	38.398486591	545322	76	.97	38.40	0	13
1443L	10	33.028486609	544880	77	.96	33.03	0	23
1443L	4	21.421486174	544997	78	1.43	21.42	0	53
1444L	11	42.056487013	545299	79	1.07	42.06	0	21
1444L	12	1.667487050	544979	80	.23	1.67	0	36
1444L	13	4.138487162	544859	81	.43	4.14	0	52
1510A	0	160.000485191	545923	82	2.00	160.00	0	5
1522L	1	37.829484597	546137	83	1.01	37.83	0	21
1524L	2	24.719484660	545745	84	.85	24.72	0	21
1531L	3	6.024484372	545152	85	.80	6.02	0	27
1533A	0	40.000484182	544922	86	1.00	40.00	0	5
1534L	4	27.432484549	544924	87	.99	27.43	0	19
1534L	5	20.093484701	545295	88	.79	20.09	0	26
1547A	0	80.000485189	545320	89	1.50	80.00	0	5
1543L	6	10.806485053	545042	90	.75	10.81	0	22
1544L	8	36.666485402	544929	91	.95	36.67	0	12
1544L	7	14.651484931	544895	92	.69	14.65	0	20
1613L	2	26.137483082	545613	93	.99	26.14	0	13
1622L	1	11.770482435	546136	94	.65	11.77	0	5
1623L	3	23.940482536	545675	95	1.00	23.94	0	7
1630A	0	160.000482775	545128	96	2.00	160.00	0	5
1641L	4	40.945483782	544928	97	1.01	40.94	0	14
1641L	6	45.121483411	545309	98	1.09	45.12	0	21
1641L	5	.752483858	545248	99	.17	.75	0	29
1643A	0	40.000483378	544925	100	1.00	40.00	0	5
1700A	0	639.000481570	545536	101	4.00	640.00	0	5
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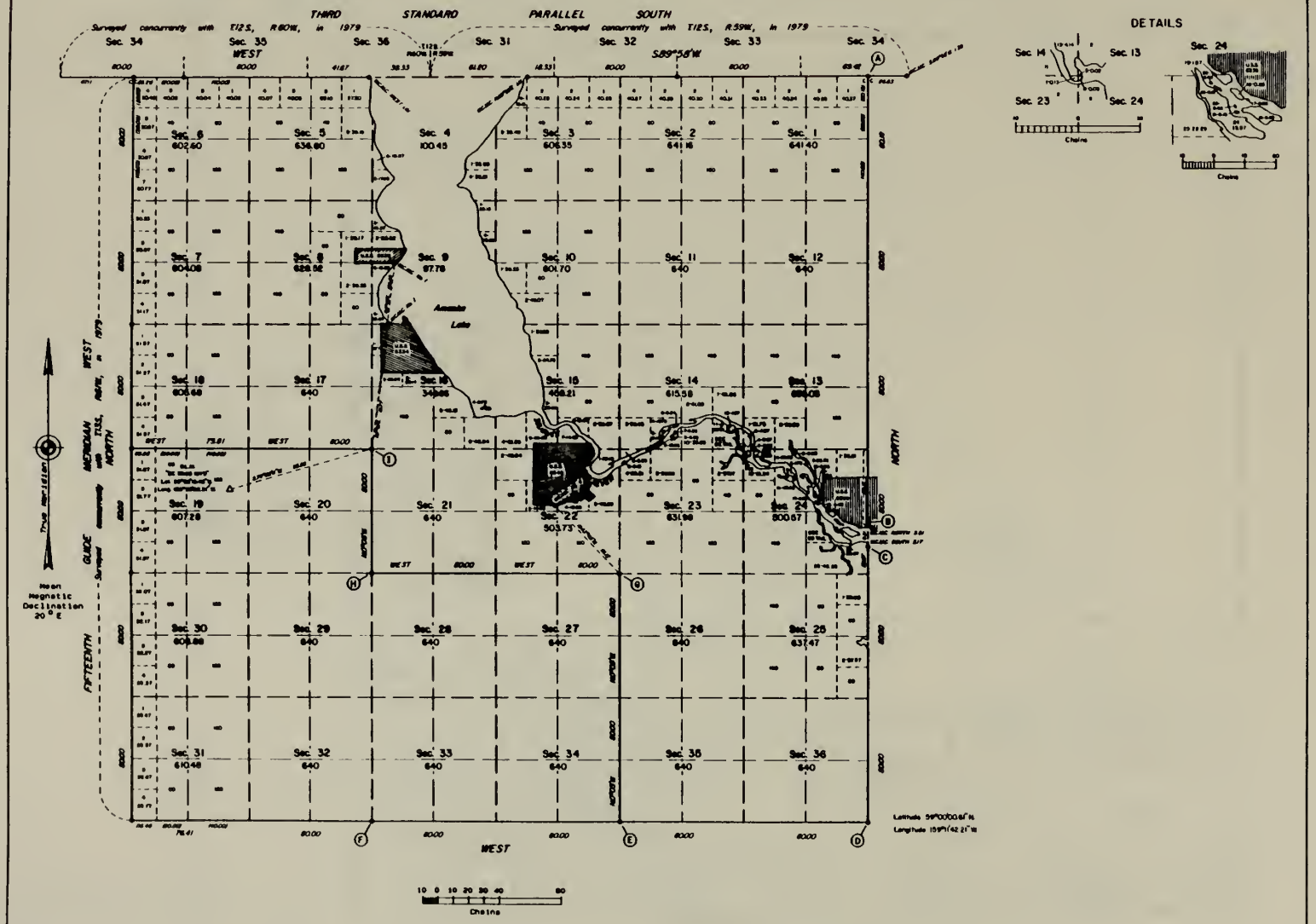
Officially Filed ORIGINAL

DATE _____

TOWNSHIP 13 SOUTH, RANGE 60 WEST, OF THE SEWARD MERIDIAN, ALASKA



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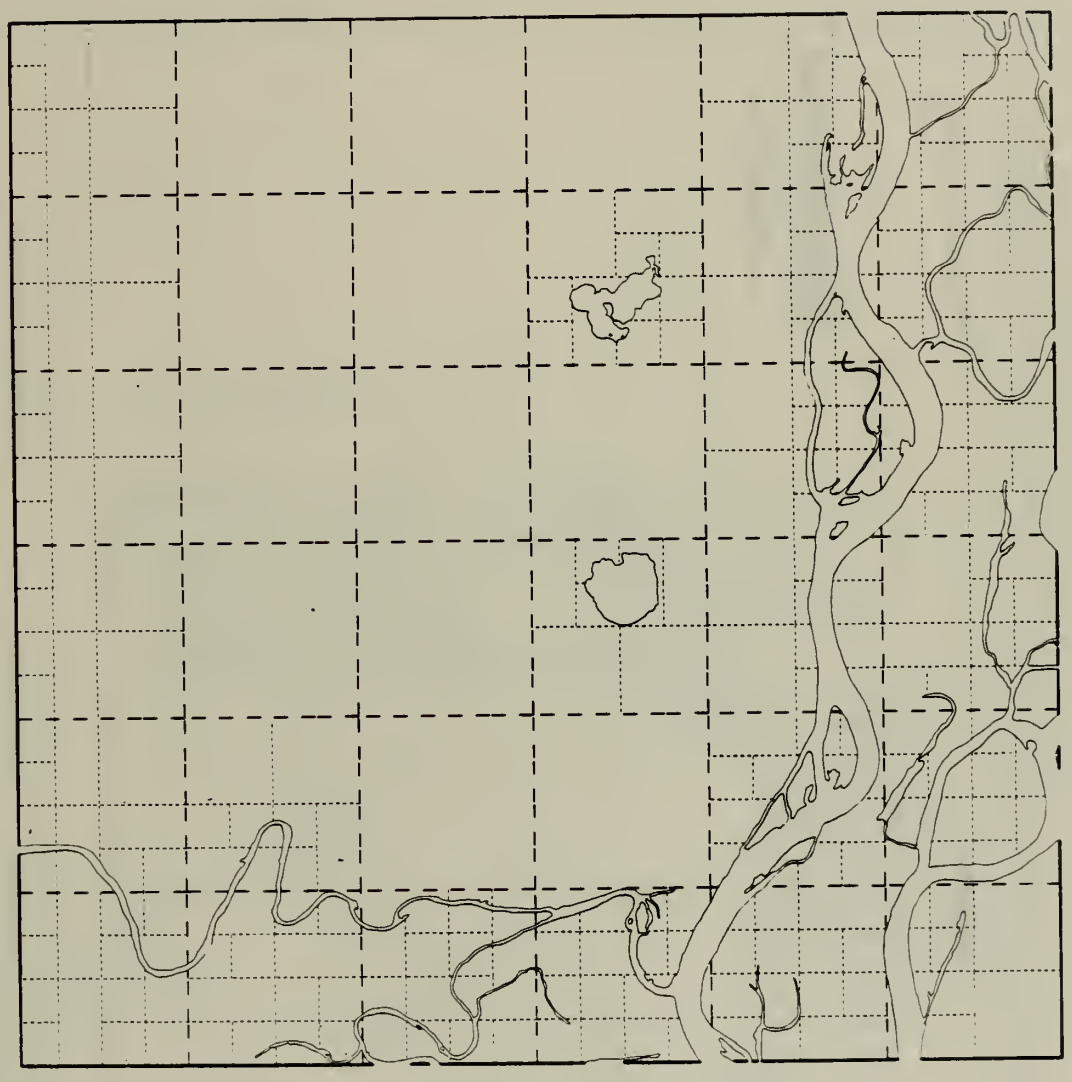


SCALE 1: 31680.

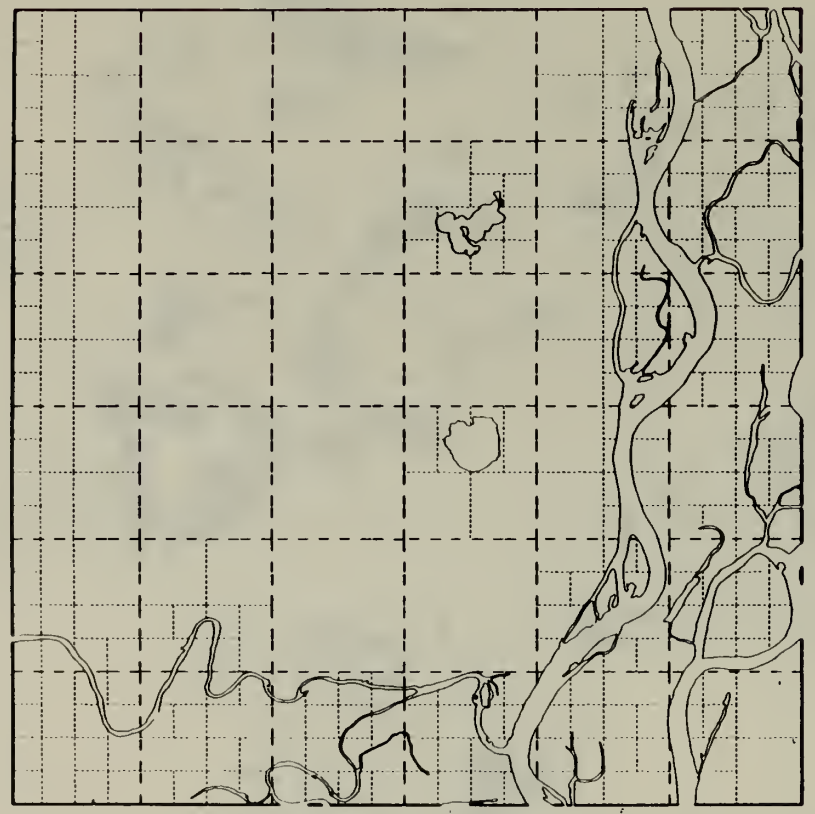
1 inch = 40 0 40 80 CHAINS

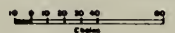
BUREAU OF LAND MANAGEMENT
ALASKA STATE OFFICE
ANCHORAGE, ALASKA

Officially Filed
DATE _____

ORIGINAL

TOWNSHIP TH, RANGE ST, OF THE MERIDIAN, ALASKA





Area Surveyed Acres

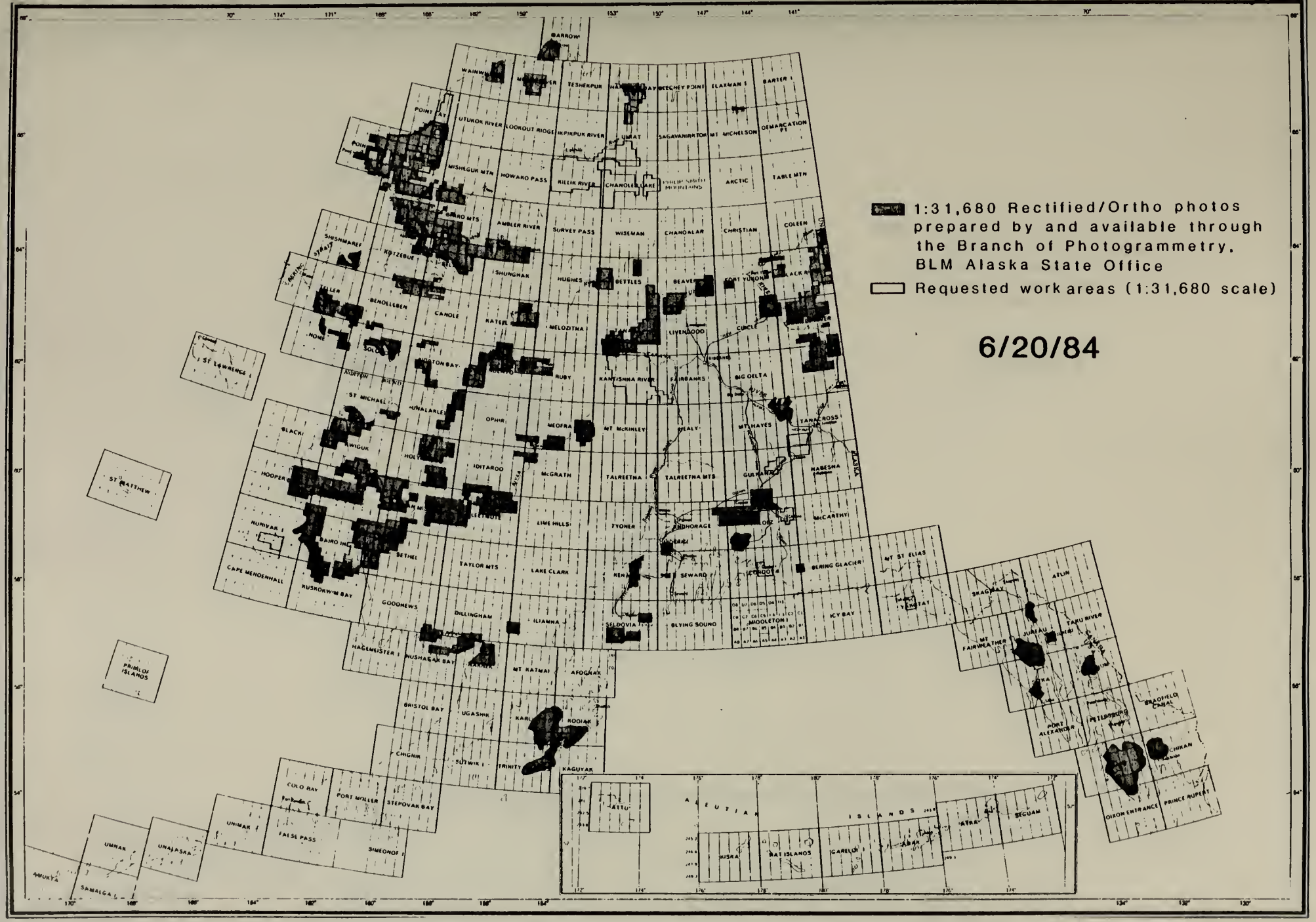
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Anchorage, Alaska

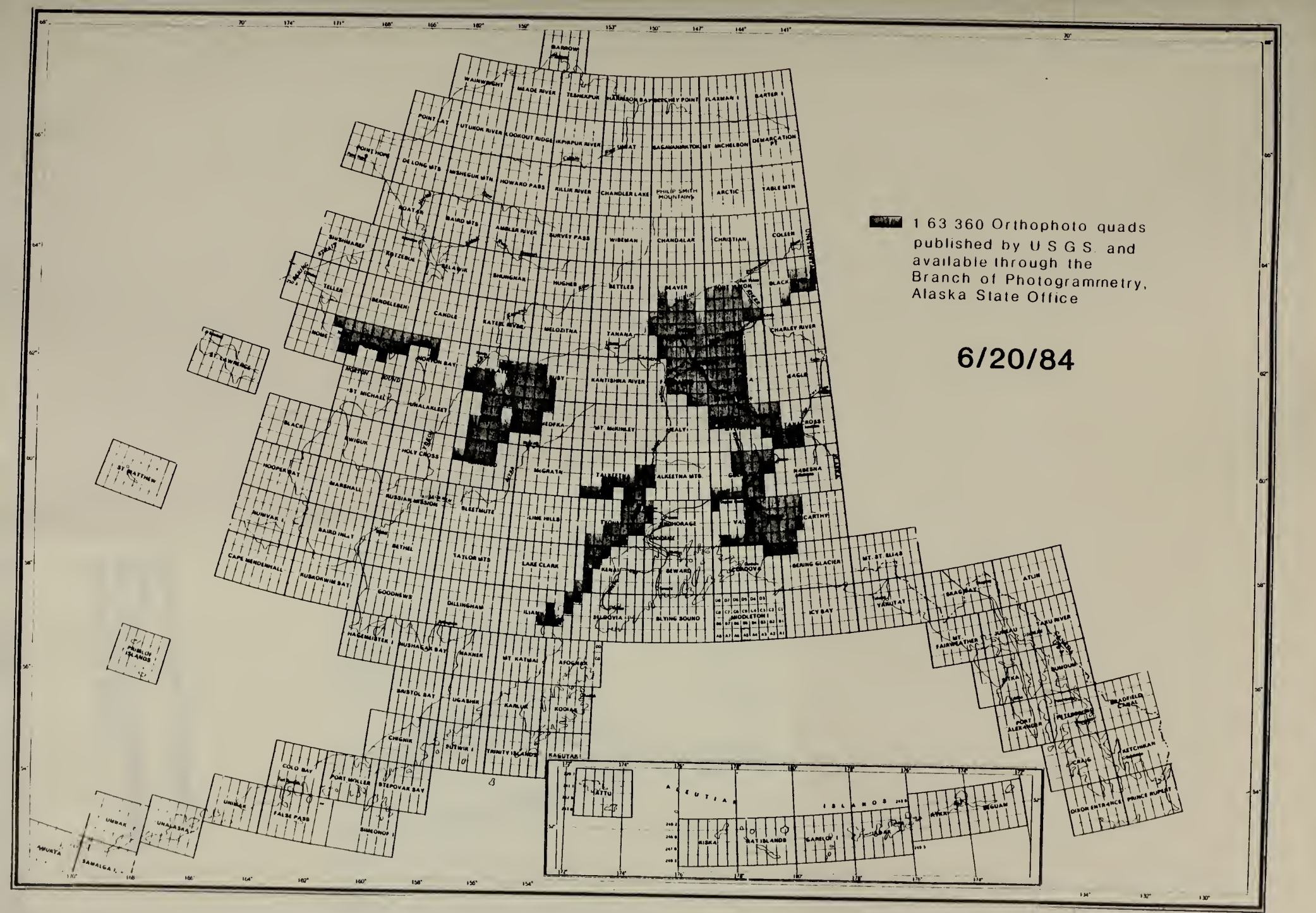
This plat is strictly conformable to the approved field notes, and the survey, having been correctly executed in accordance with the requirements of law and the regulations of this Bureau, is hereby accepted.

For the Director

_____
Date

Deputy State Director for Cadastral Survey,
Alaska


1:31,680 Rectified/Ortho photos prepared by and available through the Branch of Photogrammetry, BLM Alaska State Office
Requested work areas (1:31,680 scale)
6/20/84


1 63 360 Orthophoto quads published by U S G S. and available through the Branch of Photogramrnetry, Alaska State Office
6/20/84